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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/765,990

01/29/2004

Terence W. Barrett

3381-Z

2861

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7590

09/04/2008

BACON & THOMAS, PLLC

625 SLATERS LANE

FOURTH FLOOR

ALEXANDRIA, VA 22314-1176

EXAMINER

SAMUEL, DEWANDA A

ART UNIT

PAPER NUMBER

2616

MAIL DATE

DELIVERY MODE

09/04/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/765,990

**Applicant(s)**

BARRETT, TERENCE W.

**Examiner**

DEWANDA SAMUEL

**Art Unit**

2616

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5, 10 and 11 is/are allowed.
- 6) ☒ Claim(s) 6-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

**DETAILED ACTION**

1. This communication is responsive to the communication on 04/24/2008.
2. **Claims 1-11** are pending.

***Response to Arguments***

3. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Applicant discloses in claim 6, Feher (US patent 6,470,055) and Haas does not teach "overlaid in both time and frequency domains and thereby occupy the same physical space."

Examiner analysis: there is no mention of "overlaid in both time and frequency domains and thereby occupy the same physical space" within claim 6.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 6-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Feher ( US Patent 6,470,055) in view of Ralf Haas et al. ( "Time-frequency well localized pulse for Multiple Carrier Transmission").

**With regard to claim 6**, a system for increasing the effective communications channel bandwidth beyond that of the constrained physical bandwidth, and thereby increasing efficiency and the data rate of the channel, **(Feher discloses having a spectrally efficient FQPSK, FGMSK, and FQAM for enhanced performance CDMA, TDMA, GSM, OFDM, and other systems (title). Feher further discloses the 2nd generation of FQPSK systems with Adaptive Antenna Arrays (AAA) and adaptive Feher Equalizers (FE) and smart diversity systems has additional enhanced spectral/RF power efficiency and end-to-end performance advantages ( abstract).** by orthogonal signal spectrum overlay (OSSQ) comprising: means for decomposing the time-bandwidth product (TBP) of a given symbol in a data stream transmitted through a given bandwidth, non-linearly expanding said TBP in terms of an orthogonally overlaid signal basis set that constitute the eigensignals of said symbol within a set channel,( **Haas et al. discloses having a product of a polynom and a Gaussian pulse interpreted s a "symbol" the product is achieved orthogonally through a**

**ambiguity function of  $H(t)$  interpreted as “non-linearly expanding” , see page 9 line 3-5). It is known in the art Weber-Herbert function has the capability to expand the signal.**

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a spectrally efficient FQPSK, FGMSK, and FQAM for enhanced performance CDMA, TDMA, GSM, OFDM, and other system as taught by Feher processing a product derived from a polynomial and a Gaussian pulse interpreted as a "symbol" as taught by Haas et al. efficiently utilizing bandwidth capacity within a single channel.

**With regard to claim 7**, in combination Feher and Haas et al. teaches the method recited in claim 1. However, Feher does not disclose explicitly having orthogonally overlaid signal basis set are Weber-Hermite (WH) functions and the number of WH signals obtained in a specific symbol is set by the size of the TBP of the symbol. Haas et al. discloses having a multicarrier modulation technique whereby splitting up the large bandwidth occupied by a high symbol rate into a low rate subchannels with small bandwidth (abstract). Haas et al. further discloses having a Hermite functions and that the signals are equal to its Fourier transform, see page 8)

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a OFDM signals ( column 13 line 33) as taught

by Feher processed in a Hermite function as taught by Haas et al. efficiently utilizing bandwidth capacity within a single channel.

**With regard to claim 8**, in combination Feher and Haas et al. teaches the method recited in claim 1, wherein the complete data stream is multiplexed to produce a plurality of data channels, each of which is encoded on orthogonal signals, **(Feher discloses having a plurality of input signals interpreted as a "data stream", see column 13 line 28-31). Feher further discloses having a channel multiplexer (see column 26 line 51-55). It is inferred the channel multiplexer multiplexes input signals into multiple channels.**

7. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Feher ( US patent 6,470,055) and Ralf Haas et al. ( "Time-frequency well localized pulse for Multiple Carrier Transmission") as applied to claim 2 above, and further in view of Zou et al. ( "COFDM: An Overview", 1995).

**With regard to claim 9**, in combination Feher and Haas et al. teaches the method recited in claim 2, associated orthogonal signals are transmitted in quadrature format (I and Q);

However, Feher does not explicitly disclose OSSO symbols and associated orthogonal signals are transmitted in quadrature format (I and Q) and is the result of the addition of orthogonal signals, each of which constitutes a separate but overlaid communication channel, all occupying the same physical bandwidth. Zou et al. discloses having parallel data transmission and multiple carriers each subchannel is modulated with a separate symbol ("OSSO symbol") and then the N subchannels are frequency division multiplexed whereby utilizing the same band ( see page 2 column 1 paragraph 3.1 and column 2 paragraph 1-3).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a in phase (I) and quadrature phase (Q) baseband signals as taught by Feher utilize by symbol ("OSSO symbol") and modulated data ("orthogonal signals") transmitted N subchannels are frequency division multiplexed whereby utilizing the same band as taught by Zou et al. whereby making the implementation more cost effective.

***Prior Art***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Barrett ( US Patent 5,486,833)

Ma et al. (US Patent 7,092,436)

***Allowable Subject Matter***

1. **Claims 1-5,10 and 11** are allowed.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEWANDA SAMUEL whose telephone number is (571)270-1213. The examiner can normally be reached on Monday- Thursday 8:30-5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Q. Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DeWanda Samuel/  
Examiner, Art Unit 2616  
9/4/2008

/Frank Duong/  
Primary Examiner, Art Unit 2616